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10/506,604	03/28/2005	Edwin Nun	258011US0X PCT	4900
22850	7590	10/30/2008	EXAMINER	
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.			CHAU, LINDA N	
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ALEXANDRIA, VA 22314			ART UNIT	PAPER NUMBER
			1794	
			NOTIFICATION DATE	DELIVERY MODE
			10/30/2008	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/506,604	<b>Applicant(s)</b> NUN ET AL.	
	<b>Examiner</b> LINDA CHAU	<b>Art Unit</b> 1794	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 September 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/24/08</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 29 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 29, it recites that the microparticles are "embedded" in the surface of the injection molding. For support for the above phrase, applicants point to page 3, lines 27-36.

While this portion of the present specification discloses microparticles pressed into the surface of the injection molding, there is no disclosure that the microparticles are embedded. It is not clear what, if any, difference there is between pressing and embedding.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 10, 13, 15, 21, 23, and 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Claims 10 and 13 recite the limitation "the impressed particles" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 15, the phrase "conventional" renders the claim indefinite because it is unclear what is meant by conventional or what types of injection moldings are considered conventional.

Regarding claim 21, it recite the limitation, "further" comprising utilizing microparticles. In light of "further", it is not clear if the microparticles of claim 21 are the same as disclosed in claim 12 or in addition to those disclosed in claim 12. If the microparticles are the same, applicants should delete "further".

Regarding claim 23, recite the limitation "suitable" compound. It is not clear what is meant by "suitable" or what types of compounds are considered suitable.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-3, 6-9, and 11 are rejected under 35 U.S.C. 102(a) as being anticipated by Oles et al. (US 2002/0150723).

Regarding claim 1, Oles teaches an article with a self-cleaning surface, wherein the surface has securely anchored particles which form elevations ([0011] and [0013]). Furthermore, Oles discloses that the production of structured surfaces by injection molding is known in the art

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to give precise reproduction of the structures [0008]. However, regarding the limitation “injection”, even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.”, (In re Thorpe, 227 USPQ 964,966). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product (In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113)

Regarding claims 2 and 3, Oles teaches that the elevations have an average height of 20 to 500 nm and an average separation of less than 500 nm [0019].

Regarding claim 6, Oles teaches the particles are selected from the group consisting of silicates, minerals, metal oxides, silicas, and polymers [0017].

Regarding claim 7, Oles teaches that the particles are selected from the group consisting of fumed silica, aluminum oxide, silicon oxide, fumed silicates, and pulverulent polymers [0020].

Regarding claim 8, Oles teaches that particles have hydrophobic properties [0021].

Regarding claim 9, Oles teaches that the article's material is polycarbonates, poly(meth)acrylates, polyamides, polyester, polyether sulfones, polyacrylonitriles, polyalkylene terephthalates, polyethylenes, polypropylenes, or polystyrene ([0031] and claim 4).

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Regarding claim 11, Oles discloses that the average particle size diameter is 0.02 to 100  $\mu\text{m}$  [0031].

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 10-17 and 20-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oles et al. (US 2002/0150723).

Oles teaches an article with a self-cleaning surface, wherein the surface has securely anchored particles which form elevations as previously discussed above.

Regarding claims 10 and 13, Oles fails to disclose that the impressed particles have been anchored with from 10-90 % of their average particle diameter in the surface. However, given that the amount of anchoring would effect both how secure the particles are to the surface and the size of the elevations formed by the particles, it would have been obvious to one of ordinary skill in the art to choose amount of anchoring, including 10-90% as presently claimed, in order

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that the particles are both securely anchored to the surface while at the same time providing the desired elevations and depressions.

Regarding claim 12, Oles teaches a process for a surface with self-cleaning properties by applying and securing particles on a surface, which has elevations formed by the particles [0015-0016]. Oles doesn't disclose that the process is conducted by injection molding. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to have Oles' process be done by injection molding, wherein the particles are applied to the mold and later pressed into the surface of the injection molding, since Oles teaches that having the process by injection molding is conventional for producing self-cleaning surfaces [0008].

Regarding claim 14, Oles teaches that the polymer is polycarbonates, poly(meth)acrylates, polyamides, polyester, polyether sulfones, polyacrylonitriles, polyalkylene terephthalates, polyethylenes, polypropylenes, or polystyrene ([0031] and claim 4).

Regarding claim 15, Oles teaches that the articles are needed for the production of conventional injection moldings [0008].

Regarding claim 16, Oles teaches that the particles are applied by spray-application [0028].

Regarding claim 17, Oles teaches the particles are applied to the surface comprising of a suspension with hydrophobic particles and a solvent and then evaporating the solvent [0011].

Regarding claim 20, Oles discloses that the average particle size diameter is 0.02 to 100  $\mu\text{m}$  [0031].

Regarding claim 21, Oles teaches the particles are selected from the group consisting of silicates, minerals, metal oxides, silicas, and polymers [0017].

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Regarding claims 22 and 23, Oles teaches that particles have hydrophobic properties by virtue of treatment [0021].

Regarding claim 24, Oles teaches that the particles have been provided with hydrophobic properties prior to and after bonding to the surface [0021-0022]

Regarding claim 25, Oles teaches an article with a self-cleaning surface, wherein the surface has securely anchored particles which form elevations ([0011] and [0013]).

Regarding claim 26, Oles teaches that the self-cleaning surfaces can be used for industrial surface, which would clearly encompass storage vessels, drums, tanks, etc. as presently claimed [0004].

Regarding claim 27, Oles teaches that the particles are anchored to the surface [011] without any additional securing material [0015].

Regarding claims 28, and 29, Oles doesn't specifically teach that the particles are impressed or embedded into the surface. However, since Oles teaches that the particles are anchored to the surface, it would have been obvious to one of ordinary skill in the art at the time of the invention that the term "firmly anchored" requires the particles to be at least partially impressed or embedded in the surface [0011]. Furthermore, figure 3 illustrates that the particles is impressed or embedded into the surface.

Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being anticipated by Oles et al. (US 2002/0150723) and further in view of Keller et al. (US 2002/0016433).

Regarding claim 18, Oles teaches a process for a surface with self-cleaning properties by applying and securing particles on a surface, which has elevations formed by the particles as



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previously addressed above. Oles doesn't teach that the particles are applied to the injection mold by applying an aerosol, which comprises hydrophobic particles and a propellant gas. Keller teaches a production of shaped articles from injection molding [0076] where the hydrophobic powder particles are fix on the surface of the substrate to be coated or to produced a shaped article [0024], which the powder particles are later pressed into the surface of the injection molding with a pressure [0131], wherein the application of the hydrophobic particles [0013] are formulated by aerosol by propellant gases [0068]. It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize Keller's process to produce Oles' article, since it would easily coat the article by spray to obtain a self-cleaning surface.

Regarding claim 19, Keller fails to teach that the injection-molding process is carried out using a pressure greater than 40 bar. However, Keller teaches that the solids content of the spray ranges from 0.1 to 10% by weight [0068]. It would have been obvious to one of ordinary skill in the art at the time of the invention to have the injection-molding process be carried out using a pressure of at least greater than 40 bar in order to carry out the 10% of the solid's weight.

Claim 30 is rejected under 35 U.S.C. 102(a) as being anticipated by Oles et al. (US 2002/0150723) and further in view of Huffer et al. (US 6,783,807).

Oles teaches an article with a self-cleaning surface, wherein the surface has securely anchored particles which form elevations as previously discussed above. However, Oles doesn't teach that the securely anchored particles are present in the form of a layer. Huffer teaches an article comprising of at least one surface having self-cleaning properties (col. 3, lines 53-55), wherein the spherical particle are used and leads to a very homogeneous composite layers, where

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thus the particles are more likely to be anchored (col. 5, lines 24-27). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Oles' surface with the teachings of Huffer's layer of anchored particles in order to optimize the self-cleaning effect of the surface.

Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oles et al. (US 2002/0150723) and in view of Nun et al. (US 2003/0013795).

Oles teaches an article with a self-cleaning surface, wherein the surface has securely anchored particles which form elevations as previously addressed above. Regarding claims 4 and 5, Oles doesn't teach the aspect ratio of the particles. Nun teaches that it is known in art that reducing the aspect ratio increases the stability of the layers in self-cleaning surfaces [0014]. It would have been obvious to one of ordinary skill in the art at the time of the invention to control Oles' particle to have an aspect ratio, including 0.3-0.9 as presently claimed, in order to provide stability in the layers. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have Oles' particles with an aspect ratio of greater than 1, since Nun teaches that it is possible to generate structures with an aspect ratio of more than 1 [0014].

### ***Response to Arguments***

Applicant's arguments filed 9/12/08, with respect to the rejection(s) of claim(s) 1-30 have been fully considered. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e.,

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securely anchored microparticles *in* the surface, and not of a layer of microparticles) are not recited in the rejected claim(s). However, since there are new grounds of rejection that are not necessitated by applicants' amendment, the action cannot be made final. Upon further consideration, a new ground of rejections has been applied to show a surface with securely anchored microparticles.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LINDA CHAU whose telephone number is (571)270-5835. The examiner can normally be reached on Monday-Thursday, 8:00-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on (571) 272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Linda Chau/

/Callie E. Shosho/  
Supervisory Patent Examiner, Art Unit 1794